

# SPECIFICATION

## TITLE

### "METHOD FOR PROCESSING POSTAL MATTER AND POSTAL MATTER PROCESSING SYSTEM"

## BACKGROUND OF THE INVENTION

### Field of the Invention

4/21 > The present invention is directed to a method for processing postal matter and a postal matter processing system which allow staggered postal matter processing and are suited for use with multiple carriers.

### Description of the Prior Art

Public, automatic franking units are already known wherein a weighing device is combined with a franking device (German OS 28 19 872). Such systems, however, do not yet have a multi-carrier capability. Mail to be sent abroad is already transported by at least two respective national public mail carriers. Future mail delivery will also be handled by private carriers who may potentially use their own logos and rather different regulations for franking than the public carriers. It is specifically private carriers who, will only be present locally in the establishment phase, and who will have to collaborate with public mail carriers.

An automatic unit for franking mail and also printing out documentation thereof is disclosed in German OS 24 30 413. United States Patent No. 5,065,000, for example, also discloses that two printers be utilized for a direct printing of a bar code on the postal matter and a separate printing of a record thereof. United States Patent No. 4,923,022 <sup>177-4</sup> discloses an automatic postal device with a slot for postal items, a drive mechanism, weighing, stamping and sorting mechanism. Such postal devices require a large amount of floor space for the many containers for sorted mail and are

complicated and expensive to operate. One of the containers is always full first, which then negatively influences the work of the entire postal device. When, however, the postal devices are emptied in short cycles, then the containers with sorted mail are filled to different degrees and must also be individually emptied although one container is nearly empty. The transport costs are proportional to the transport distance and inversely proportional to the quantity of mail. The sorted mail must, of course, be separately transported, which requires additional attention and exertions on the part of the carrier company. If some carriers make higher demands on the franking stamp imprint in the future, for example a security imprint with 2-D bar code, high-grade printers that are expensive to maintain must be utilized.

An automatic postal matter receiving system is disclosed in European Application 503 311 with a money card or customer card and with a standardized postal matter delivery with a transport stage that does not include either a device for weighing or for franking. The money card allows an immediate debiting of a postage fee that is derived on the basis of the selection of the standardized postal matter delivery. The postage calculation does not take the weight into consideration. The transport stage is unlocked after the postage calculation. The employment of separate storage containers is also necessary since a distinction between shipping types is no longer subsequently possible due to the absence of a franking imprint. A conventional postage fee memory in combination with a secured postal matter storage container is required in combination with the card reading unit. The container is emptied by an authorized person, who loads the data from the postage fee memory into a specific removal chip card. When the sender has been authorized with a specific customer card when the postal matter

is received, the card allows the customer account to be charged with the incurred fees in a central accounting location.

The remaining method up to the distribution of the unfranked mail is not disclosed in European Application 503 311, however, it can be assumed that the carrier also undertakes the mail distribution. If a public carrier were engaged for the further transport and for the distribution of postal matters, then the stipulations of this carrier for identifying or franking mail as well as for debiting would have to be adhered to. Since, however, no franking ensues, the stipulations of, for example, the Deutsche Post AG (or the USPS) are not adhered to. As a rule, postal matter, for example letters to be sent abroad, must at least be stamped with an imprint. The elimination of a franking imprint harbors further disadvantages such as problems of data documentation, a risk of fraud due to the introduction of a plurality of unpaid or overweight pieces of mail, particularly given the standard delivery of large-format postal matter.

### **SUMMARY OF THE INVENTION**

An object of the present invention is to provide a postal matter processing method and system wherein the deficiencies of the prior art are avoided and which allow secure and economical postal matter processing, and wherein the receiving stations are emptied in a short cycle without maintenance thereof and without a separate handling of the mail in the distributing stations having to ensue with the same frequency as the emptying of the receiving stations.

The above object is achieved in accordance with the principles of the present invention in a method and a system for postal matter processing, wherein a number of







write the accounting data into the specific carrier card allocated to the respective number and to actuate an output closure (port) at the storage container for receiving the postal matter. The specific carrier card is fashioned for removal of postal matter from the receiving station by a first mail carrier as well as for input, by an authorized party, of the accounting data into a postage meter machine of the distributing station. The data transmission can likewise ensue via an alternative means (on line or off line) to the distributing station. The distributing station is at least composed of a postage meter machine and a sensor and a delivery arrangement preceding in the mail stream, the latter including a scanner for scanning the marking that was printed in the receiving station. The postage meter machine has a read/write unit for the specific carrier cards, a second non-volatile memory, a franking printer and a connection for the printout of received lists via a second printer as well as a control unit that is programmed to derive the number of the scanned piece of mail from the scanned marking data and to determine the appertaining, input accounting data, possibly with the appertaining weight, from the second non-volatile memory in order to correspondingly set the postage meter machine before the franking.

It is also advantageous that the shipper can employ a value or a customer card for paying for the service to be provided by the carrier. The debiting by value card is premised on an automatic format and thickness recognition of the pieces of mail. The value card can be a rechargeable money card. The customer card only allows the input of an identification number. A debiting does not ensue from the card but ensues either subsequently from the customer card or an invoice is prepared. A loss of the customer card is not tragic since money is thus not automatically lost as long as the first carrier

is immediately notified who then can block the postage meter machine for the corresponding identification number. An added advantage is achieved due to the closure mechanism for the slot as protection against willful property damage to the receiving station in combination with the read/write unit. A card inserted into the latter is retained if vandalism is detected by additional sensors. The card owner, and possibly, the person causing the damage, can be determined via the identity number of the card. The keyboard and the display unit also can be protected in a similar way.

### **DESCRIPTION OF THE DRAWINGS**

Figure 1a illustrates a first version of a mail processing system with receiving stations and with a distributing station in accordance with the invention.

Figure 1b is a block circuit diagram of the receiving station in the first version.

Figure 1c is a perspective view of the distributing station in the first version.

Figure 2a illustrates a second version of a mail processing system with receiving stations and with a distributing station in accordance with the invention.

Figure 2b is a block circuit diagram of the receiving station in the second version.

Figure 2c is a plan view of a printing feeder arrangement of the distribution station in the second version.

Figure 2d is a plan view of a sensor and feeder arrangement of the distributing station in the second version.

Figure 2e is a block circuit diagram of the receiving station in a third version.

Figure 2f is a perspective view of the distributing station in the second version.

Figure 3 is a perspective view of a sensor and feeder arrangement.



## **DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Figure 1a shows a first version of a mail processing system with receiving stations 12, 13, 14 and with a distributing station 10. These receiving stations represent an arbitrary number n of receiving stations. The receiving stations 12, 13, 14 can be placed at gas stations, shopping centers, self-service areas of banks, in the proximity of EC automats (in Europe) and at other important locations. The distributing station 10 is located remote therefrom. For example, the frankings are undertaken in a service center. The system assumes that the sender has a value card C (i.e., a credit card) and inserts it into a slot of the receiving station 12. The receiving station 12 generates a different number for each postal matter B. The sender undertakes the required inputs for the shipping at a keyboard 26 of the receiving station in conformity with the postal matter B. A slot 22 is released by a closure. The postal matter B inserted into the slot 22 is weighed and marked inside the receiving station 12. The marking ensues, for example, with a number and/or a bar code in a predetermined area on the postal matter B. The marked, unfranked postal matter A lands in a storage container shown in Figure 1b. An ordinary mailbox 43 for letters prepaid with postage stamps or meter imprints or in some other way can be arranged next to the receiving station 12 or laterally integrated therewith. In a known way, the mailbox 43 has a slot 42 for inserting the stamped letters. The data entered by the sender and internally measured in each receiving station 12, 13, 14 are non-volatilely stored. An authorized party of the first carrier has a transport 46 and routinely empties the mailboxes and storage containers of the receiving stations 12, 13, 14. Opening the receiving stations 12, 13, 14 requires an access means, such as insertion of a specific carrier card E into the corresponding

slot of a read/write unit 23 of the receiving stations 12, 13, 14. For transmission of the data to the distributing station, the non-volatilely stored data are entered into a transmission means, preferably by loading into the specific carrier card E.

Upon arrival of the transport 46 at the distributing station, the franked letters are placed in a second deposit 65. The operation of the distributing station 10 initially requires a data transfer, for example an insertion of one of the specific carrier cards E into the corresponding slot of a read/write unit 63 of the postage meter machine 60, in order to transfer the data stored in the card. The appertaining postal matter now can be automatically franked according to these data. Before the franking, the postal matter passes through a sensor and feeder stage 55 and is thereby scanned by a scanner 50 in view of the marking. The marking information is communicated via the feeder 55 to the postage meter machine 60, is converted into a letter number and is checked in view of its appearance in a list of the stored data. In a known manner, the postage meter machine 60 has an accounting memory 69 that non-volatilely stores the list of stored data and wherein a debiting is undertaken. After the franking, the letters proceed into a first deposit 68 arranged downstream. A received list 67 having the stored data from the accounting memory 69 can be printed out with a printer 66 for a stack of franked pieces of mail. The printer can be connected to the postage meter machine either directly or, alternatively, via a personal computer (not shown). The stack of franked pieces of mail from the first deposit 68 with the received list 67 and the stamped letters from the second deposit 65 are delivered by a transport 47 of the first carrier to a mail distribution center 80 of the second carrier and are further-transported with the transport 81 of the latter to the addressee or distribution locations in order to distribute the mail.

Figure 1b shows a block circuit diagram of the receiving station 12 of the first version. The read/write unit 23 is connected in terms of control to a drive (not shown) of a closure mechanism of the slot 22 and to a unit 25 for control and postage calculation. Since the slot 22 is only opened given an inserted card, there is effective protection against vandalism for the postal matter within the receiving station. The slot 22 is arranged upstream of a scanner and feeder 20 at the housing of the receiving station. A marking printer 30 is arranged downstream of the scanner and feeder 20. Alternatively, the marking printer can also be a component part of the scanner and feeder 20. The marking with the marking printer 20 can thus advantageously ensue upon or immediately after the deposit of the postal matter B. A storage container 40 for marked postal matter is arranged downstream behind the marking printer 30. A static scale 31, which includes a weighing pan 35 and a weighing cell S6, is a component of the storage container 40. A port 41 with appertaining, controllable opening device is arranged at the housing of the receiving station. The weighing cell S6 contains electronics for the transmission of a weight signal to the control unit 25. The weight of the individually supplied pieces of mail is determined in the control unit 25 according to the difference method.

The presence of postal matter B to be delivered to the mail stream is detected with a sensor S1. The sensors S2 and S3 are for a format identification, the sensor S3 is for a thickness identification, and the sensor S5 is for a determination of the position of the supplied postal matter B in the transport path, and the sensor S7 allows a determination of the filling level to be undertaken by the control unit 25. A suitable scanner and feeder is disclosed in German patent application 19912807.3. Inventively,

the marking printer 30 is additionally provided in this latter solution. For example, an arrangement of the marking printer 30 and the sensor S1 ensues in the pre-separation region.

The control unit 25 is connected to the aforementioned components 20, 22, 23, 30, 41 in terms of control. The control unit 25 is equipped with a fee memory 39 and is programmed for calculating postage. The current rate for calculating the postage can be reloaded via the write/read unit 23 connected to the control unit 25 with a RATE TABLE chip card, or optionally via a connected modem 24. A display unit 27, a clock/date module 28, a non-volatile memory 29 and a customer record printer 36 are connected to the control unit 25. The customer record printer 36 can print out the number of the piece of mail, the time data and the shipping data input upon mail deposit as a customer record. The keyboard 26 and the display unit 27 form a user interface and can be fashioned combined with one another (soft keys) are integrated (touch screen). The user interface can likewise be protected against damage, for example vandalism, by a closure mechanism.

It is optionally provided that the receiving station is supplied with power from an autonomous energy source 33, can be connected to solar collectors 34.

Figure 1c shows a perspective view of the distributing station of the first version, having a sensor and feeder 55, a postage meter machine 60 and a deposit 68. A scanner 50 is arranged in an opening at the mail application point of a lateral guide plate, for example in the separation area between the openings in the guide plate for two drive drums. A commercially available scanner, for example of the type LS 4100 of the Datalogic company, is utilized as scanner for a bar code. A sensor and feeder

55 suitable for such mixed mail processing is explained in greater detail with reference to Figure 3. After the letters are applied, a pressure applicator is actuated, for example a plate 556 is pivoted into a position that presses the stack of letters against the guide plate, so that the letter placed at the bottom is scanned first. The stack is separated by the scanned letter being transported in the direction of the storage container. A separation of the supplied letters is undertaken under the cover 557, as disclosed in German PS 196 05 017, corresponding to United States Patent No.5,954,324, and in the aforementioned German Patent Application 199 12 807.3

In a known manner, the postage meter machine 60 is composed of a meter 62 and a base. A system based on the postage meter machine Jet Mail® of Francotyp-Postalia AG & Co. is particularly suited, as disclosed in detail in, among others, European Patent Applications 875 864 and 901 108. The base is equipped with a chip card read/write unit 63 that is arranged behind a guide plate and is accessible proceeding from an upper housing edge. After the postage meter machine is turned on with a switch next to the read/write unit 63, a carrier card E can be inserted into an insertion slot from top to bottom. A supplied letter A that stands on edge and that has its surface to be printed lying against the guide plate is then printed with a meter stamp according to the input data and then drops into the deposit box 68.

The feeder 20 in the receiving station 12 can have the same structural format as the feeder 55 in the distributing station 10. The feeder 20 of the receiving station 12 (shown in Figure 1b), however, can be additionally equipped with sensors for sensing the format and the thickness of the postal matter. A scale 31 with the weighing cell S6 for weight measurement is arranged following the sensor and feeder 20. The sensor

data and the weight measured with the scale 31 are communicated to the control unit 25. The control unit 25 controls the transport of the postal matter and is fashioned for calculating postage. The customer's card is a value card C. The debiting of the postage from the value card C and a logging of the shipping data are undertaken in the non-volatile memory 29 of the control unit 25 of the receiving station 12. The control unit is programmed to undertake a debiting from the value card C via the read/write unit 23 after the marking has been printed.

The inventive method includes the following steps: A card of the customer is identified when it is inserted into a first read/write unit 23 of the receiving station and input of shipping data. A number for a piece of mail B is generated and the number and the entered shipping data are written into a first memory 29 of the receiving station. The slot 22 of the receiving station is enabled for the purpose of feeding the postal matter. The postal matter B are marked at the receiving station. Further relevant data are entered into the first memory 29 of the receiving station. The marked postal matter A is intermediately stored in the storage container 40 of the receiving station. A specific carrier card E is inserted into the first read/write unit 23 and the accounting data are loaded from the first memory 29 into the memory of the specific carrier card E. The port 41 of the storage container 40 with the specific carrier card E is opened for removing the marked postal matter A. The marked postal matter A and the specific carrier card E are transported by a first mail carrier 46 to the remote postage meter machine 60 in a distributing station. The specific carrier card E is inserted into a remote, second read/write unit 63 and the accounting data are loaded from the memory of the specific carrier card E into a second memory 69 of the postage meter machine

60. The postal matter A is inserted into a sensor and feeder 55 upstream of the postage meter machine of the distributing station. Correspondingly marked postal matter A are franked dependent on the appertaining accounting data in the second memory 69. A list 67 is printed with a second printer 66. A first mail carrier 47 transports the franked postal matter with the appertaining received list 67 to a second mail carrier in a remote mail distribution center 80 for mail distribution by the second mail carrier 81.

As noted above, the customer's card is a value card C. The delivery of postal matter is detected by a first sensor S1. The step of entering further relevant data into the first memory 29 of the receiving station includes at least one time of day and date input by the clock/date module 28.

When the customer's card is a value card C, the step of entering further relevant data into the first memory 29 of the receiving station includes an automatic data input by further sensors S2 and S4 for sensing the format and by sensor S3 for the thickness of the piece of mail in the feeder 20 and from the weighing cell S6 for weight measurement in a scale 31, 35 of the receiving station with subsequent calculation and debiting of the postage from the value card C. A suitable embodiment for the sensor and feeder stage 20 with the sensors S2 through S5 is disclosed in greater detail in the German Application 199 12 807.3.

A further system differs from the system of Figures 1a, 1b and 1c in that the customer's card is a customer card D (i.e., a debit card) that has an identification number is shown in Figure 2a with receiving stations and with a distributing station. Advantageously, the sensors for determining format and thickness as well as a scale

can be eliminated in the receiving stations. The receiving station thus can be more economically manufactured, which can be seen from Figure 2b. Therein, the identification number together with the shipping data, the time of day, the date and the generated number are stored in a first memory 29 of the receiving station. When the deposit of postal matter is detected by a first sensor S1, then the marking is triggered. A customer receipt 37 is also printed out.

It can be seen from Figure 2a that a communication of the stored data to the postage meter machine 60 of the distributing station 60 can again ensue with the specific carrier card E. After the step of inserting the postal matter into a sensor and feeder 55 of the distributing station, the distributing station implements a sensing of the format and of the thickness of the piece of mail in the feeder 55 and a weight measurement in a dynamic scale 58 for the postage meter machine 60 of the distributing station 60. A more detailed specification of a suitable sensor and feeder 55 with sensors for sensing the format and the thickness of the piece of mail are disclosed in German Application 199 12 807.3.

Further details about the structural format of a suitable dynamic scale are disclosed in German Patent Application 198 33 767.1-53. The control, for example, can ensue as disclosed in German Applications 198 60 296.0 or 198 60 295.2. The weight measurement in a dynamic scale preferably ensues according to German Patent Application 198 60 294.4.

After the calculation of the postage, the debiting of the postage from the customer account ensues at the customer bank 90 or from the account at the data center via telepostage. A personal computer 59 preferably has a communication



connection with the customer bank 90. The letter remains unfranked when a debiting of the postage from the customer account cannot be undertaken. In a way that is not shown, the first deposit 68 can be equipped with a shunt or with an additional eject compartment with third deposit for unfranked letters. It is advantageous for operation when the personal computer 59 is connected to the postage meter machine 60 and to the printer 66 for the received lists 67. A rate memory 61 and an accounting memory are required for calculating the postage in the deposit station, these preferably being components of the postage meter machine.

A meter generally forms a (second) control unit for the postage meter machine base.

According to an alternative proposal, the meter function of the postage meter machine can be assumed by the personal computer 59. Such a printing machine base station controlled by a personal computer has been disclosed in detail in, for example, European Application 866 427.

Figure 2b shows a block circuit diagram of the receiving station according to the second version. A feeder 20' is arranged preceding the marking printer 30, i.e. upstream, and a slot 22 with closure mechanism is again arranged preceding the feeder 20', this closure mechanism being again driven by the read/write unit 23. The opened slot 22 allows an insertion of at least one large-format letter having a width of 250 mm and a thickness of 55mm into the feeder 20' or, alternatively, an insertion of a stack of letters with smaller formats and/or thickness.

A suitable feeder with pre-separation and printer can, for example, be constructed as explained in greater detail with reference to Figure 2c. Sensors for the

format and thickness measurement are not required, differing from the first version. Inventively, an ink jet printer 30 is arranged in the pre-separation area as marking printer.

Differing from the conventional, generally practiced procedure, the letters of a stack are inventively printed first and then separated or removed. As a result, the entire letter acquisition or sensing and print control can be significantly simplified. Letters of an arbitrary thickness up to small packages thus can be directly printed with a bar code and mixed mail B of slight thickness deposited in stacks can be automatically processed. Compared to a purely manual system apparatus, a significant enhancement of the processing speed is achieved given automatic stack processing.

As schematically shown in Figure 2b, the common storage container 40 for marked postal matter A is again arranged downstream, following marking printer 30 and feeder 20'. Differing from the first version, however, the installation of a scale is eliminated. The receiving station can, for example, have a cabinet-like structure, whereby the slot 22, the read/write unit 23, if present, a modem 23, the control unit 25, the keyboard 26, the display unit 27, the clock/date module 28, the non-volatile memories 29 and 39, the customer record printer 36 as well as the port 41 are built into a door. The port 41 allows the authorized carrier to unlock the door in order to open it. The control unit 25 is again connected for control purposes to the aforementioned components 20', 22, 23 29, 30, 36, 41. The energy source 33, the feeder 20' with the marking printer 30 and the common storage container 40 are arranged in the inside of the cabinet, so that the storage container 40 can be emptied when the door is opened. Such a receiving station can be placed at an arbitrary location.

In combination with a number of letters from a stack of letters deposited in the mail, the document 37 printed by the forms printer 36 enables a known recording for the postal customer with respect to the printing of the identification number on the postal matter in the receiving station.

In a preferred embodiment of the invention, the feeder 20' and a marking printer 30 preceding a storage container 40 are arranged in the receiving station in the direction of the mail stream and are connected to the control unit 25.

The feeder 20' has an input closure with a slot 22 that can be driven by the read/write unit 23, so that the sender can insert at least one piece of mail B through the slot 22 into the feeder 20' only given a card D inserted into a slit of the read/write unit 23 by the sender;

A non-volatile memory 29 for accounting data and a clock/date module 28 are connected to the control unit 25.

The control unit 25 is programmed to allocate a number to every piece of mail and, dependent on the shipping data actuated via the keyboard 26, to undertake an accounting in the non-volatile memory 29 under the aforementioned number and to drive the marking printer 30 to print this number on the piece of mail B while it is being transported downstream.

Given a specific carrier card E inserted into the slot of the read/write unit 23 by an authorized party, the control unit 25 is programmed to write the accounting data into the specific carrier card E allocated to the respective numbers, to actuate an output closure port 41 at the storage container for removing the postal matter.

The specific carrier card E is fashioned for removal of postal matter from the receiving station by a first mail carrier 46 and for inputting the accounting data into a postage meter machine 60 of the distributing station by a party authorized to do so.

The distributing station is composed at least of a postage meter machine 60 and a sensor and feeder 55 preceding this in the mail stream. The sensor and feeder stage 55 has a scanner 50 for scanning the marking that was printed on the item in the receiving station.

The postage meter machine 60 has a read/write unit 63 for the specific carrier cards E, a second non-volatile memory 69, a franking printer and a connection for the printout of received lists 67 via a second printer 68 as well as a second control unit that is programmed to derive the number of the respective piece of mail from the sensed marking data and to determine the appertaining input accounting data from the second non-volatile memory 69 in order to undertake a corresponding setting of the postage meter machine before the franking.

The control unit 25 of the receiving station 17 is programmed -- after the insertion of a customer card D into the read/write unit 23 -- to non-volatilely store the identification number allocated to the number of the postal matter, the date and the time of day as well as the shipping data that have been input in the first memory 29 of the receiving station 17. The control unit 25 of the receiving station 17 is also programmed -- after insertion of a specific carrier card E -- to load the stored data into the memory of the carrier card E, so that a debiting from the customer account at a bank 90 of the customer can be undertaken after the marking but before the franking.

Figure 2c shows a plan view of a printing feeder of the receiving station 17 according to the second version. After being deposited, the postal matter A resides on a lower guide plate 252 parallel to a lateral guide plate 251. The guide plate 251 has openings for the transport, printing and sensor means. An opening 201 for the printer 30 is arranged in the pre-separation area between the openings 203 and 204 for the drive drums 253, 354. For example, an ink jet printer is utilized as marking printer. For the purpose of depositing the mail, the applicator 256, in conjunction with the opening of the slot, is driven by an actuator (not shown) until they are at a maximum distance from the lateral guide plate 251. The covering 257 of the mechanism in the separation area limits the depth of the deposit region and simultaneously forms a stop edge for a stack of mail (mixed mail). A sensor S1, for example a light reflex sensor, signals the presence of at least one piece of mail in the pre-separation area. Before or after the input of the shipping parameters, the printer 30 prints a marking, and the applicator 256 -- driven by the actuator (not shown) -- is activated to resiliently press the stack against the printing region. After the marking has been printed, the printed piece of mail, driven by the drive drums 253, 354, is moved forward to the separation area, and drive belts 258 and an ejector 259 assume the further transport to the storage container 40. A sensor S5, for example a light barrier, signals the ejection of the at least one piece of mail into the storage container 40.

Figure 2d shows a plan view of a sensor and feeder stage 55 of the distributing station 11 according to the second version. The mechanical structure can ensue in the same way as set forth in Figure 2c, but a sensor 50 is arranged in a window-like opening 501 of the lateral guide plate 551 instead of the printer 30 in order to scan a

bar code that has been printed on the posted item. The lateral guide plate has openings for the transport, scanner and sensors. The opening for the scanner 50 is arranged between the openings 503 and 504 for the drive drums 553, 554, whereby the sensor S1 and the applicator 556 have an additional protective function for the eyes. A laser beam is shut off on the basis of the sensor signal of the sensor S1 so that the laser beam of the laser scanner is not directed directly into the eye of the observer when a letter is not applied to the sensor and feeder stage 55. The bar code is then scanned only during the separating. Moreover, the contact pressure bow 556 is sufficiently wide so that no laser beam can proceed directly into the eye of the observer during operation of the sensor and feeder stage 55.

A suitable scanner is the type LS4100 of the Datalogic company having the dimensions 84 x 68 x 28 mm. The scanner LS4100 is mounted at a distance of at least 40 mm from the guide plate 551. An embodiment having a 90° deflection mirror at the scanner is employed. This type allows a maximum scan rate of  $S_{max} = 800$  scans/sec.

A piece of mail is transported with the velocity  $V = 630$  mm/sec and preferably carries a bar code with lines parallel to the transport direction. The length of the lines  $L$  and the velocity  $V$  of the piece of mail enter into the number of effective scans  $N$ . The following equation applies:

$$N = \{(L/V) \cdot S_{max}\} - 2 \quad (1)$$

A vertically glued label with a 10 mm bar code line length on a letter that is transported at 630 mm/sec yields a number of  $(800 \cdot 10/630) - 2 = 10$  effective scans, which is adequate for the sensor and feeder of the JetMail® postage meter machine in order to

distinguish a bar code from other imprints (address) on the basis of the redundancy of the measured values.

Figure 2e shows a block circuit diagram of a receiving station 15 according to a third version. The separate marking printer is also eliminated in this most economic version. The function thereof is assumed by the forms printer. The form 27 printed out by the customer receipt and marking printer 36 after the card identification number, the generated letter number and the input shipping data have been stored in the non-volatile memory 29 contains a section 38 with the bar code corresponding to the generated letter number. The letter number can be printed out together with the bar code, so that the section 38 is human-readable and machine-readable. The section 38 is implemented as a self-adhesive tape and is glued onto the piece of mail A by the person sending the letter. The piece of mail A can then be inserted into the storage container 40 through the open slot 22. The container 40 and a separate mailbox 42 with a slot 22 for inserting stamped letters can be opened by carrier card E. The control unit 25 control a common port 41 in order to open the storage container 40 and the separate mailbox 42 for the purpose of being emptied by the first carrier.

The postal matter processing system has a storage container 40 with a filling level sensor S7 that is connected to the control unit 25 is arranged in the receiving station.

The storage container 40 has an input closure with a slot 22 that can be driven by the control unit 25, so that the customer can only insert postal matter A through the slot into the storage container when a card D has been inserted into a slit of the read/write unit 23 by the sender.

A non-volatile memory 29 for accounting data and a clock/date module as well as a customer form and marking printer 36 are connected to the control unit 25.

The control unit 25 is programmed to assign a number to every piece of mail B and, dependent on the shipping inputs actuated via the keyboard 26, to undertake an accounting entry in the non-volatile memory 29 under the aforementioned number and to drive the customer form and marking printer 36 in order to print the aforementioned number of the postal matter, the time data and the shipping data that was entered when the mail was deposited as a customer form, and to print a marking on a section 38 that is provided for being applied to the postal matter B.

The control unit 25 is also programmed, given insertion of a specific carrier card E in the slot of the read/write unit 23 by an authorized party, to write the accounting data into the specific carrier card E allocated to the respective numbers, to actuate an output closure (port 41) at the storage container for removal of the postal matter.

The specific carrier card E is fashioned for removal of postal matter from the receiving station by a first mail carrier 46 and for the input of the accounting data into a postage meter machine 60 of a distributing station by a person authorized to do so.

The distributing station at least includes a postage meter machine 60 and a sensor and feeder stage 55 preceding in the mail stream. The sensor and feeder stage 55 includes a scanner 50 for scanning the marking printed on in the receiving station.

The postage meter machine 60 has a read/write unit 63 for the specific carrier cards E, a second non-volatile memory 69, a franking printer and a connection for the printout of received lists 67 via a second printer 66 as well as a control unit 59, 62 that is programmed to derive the number of the postal matter from the scanned marking



data, and to determined the appertaining input accounting data from the second non-volatile memory 69 in order to undertake a corresponding setting of the postage meter machine 60 before the franking and a debiting from the customer account at a customer bank 90 after the marking but before the franking.

Figure 2f shows a perspective view of the distributing station 11 according to the second version of the postal matter processing system. Such a distributing station 11 can frank postal matter that was marked in relatively simply constructed receiving stations 15 or 17, 18, 19. The distributing station 11 has a sensor and feeder stage 55 suitable for mixed mail processing, a dynamic scale 58, a postage meter machine 60 and a deposit 68. A scanner 50 is arranged behind an opening in the pre-separation area. The scanner, for example of the type LS4100 of the Datalogic company, is employed as scanner for the bar code marking. The postage meter machine 60 of the distributing station has a rate memory 61 for calculating the postage according to current rate schedules.

In this version of the inventive method an identification number of a customer card D together with the shipping data, the time of day, the date and a generated number are stored in the first memory 29 of the receiving station 15.

The number of the piece of mail, the time data and the shipping data input upon deposit of the mail are printed as customer receipt 37 and a marking 38 is printed by a customer form and marking printer 36 of the receiving station.

The application of a machine-readable marking 38 to the postal matter B ensues externally of the receiving station 15 and enabling the slot 22 of the receiving station 15 for marked postal matter A ensues.

After storing, the marked postal matter A is transported by a first mail carrier 46 to the distributing station 11, whereby a communication of the stored data to the postage meter machine 60 of the distributing station 11 ensues with a specific carrier card E.

The insertion of the postal matter into a sensor and feeder means 55 of the distributing station is detected with a sensor S51, as a result of which a scanning of the marking with a scanner 50 is triggered.

Sensing of the format and of the thickness of the postal matter is implemented in the feeder stage 55 and a weight measurement is implemented in a scale 58 before the franking with the postage meter machine.

Debiting of the postage from the customer account ensues after the calculation of the postage.

Figure 3 shows a perspective view of a sensor and feeder stage 55 in the distributing station. The feeder stage 55 is functionally divided into a pre-separation area 55a and a separation area 55b. A back guide plate 551 that is inclined slightly back and a lower guide plate 552 that is orthogonal thereto are provided for guiding the letters A. A commercially available scanner 50 for scanning the marking printed on in the receiving station is arranged in the pre-separation area 55a behind an opening 501 of the guide plate 551.

As a stack, the letters A are arranged with non-positive lock between an applicator 556 and the back guide plate 551 with the edge of their envelope flap standing on the lower guide plate 552. The applicator 556 can be pivoted out of an idle position into the illustrated operating position and is arranged lockable.

On the basis of two drive drum combinations 553, 554, which, due to their specific fashioning, effect a loosening of the letter stack, the letters A are pushed one after the other from the pre-separation area 55a into the separation area 55b gliding along the back guide plate 551. Further details about the mechanics in the separation area 55b are disclosed in German Patent Applications 198 36 235.8 and 199 12 807.3.

Although modifications and changes may be suggested by those skilled in the art, it is the intention of the inventors to embody within the patent warranted hereon all changes and modifications as reasonably and properly come within the scope of their contribution to the art.

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